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## Marine isopod crustaceans collected from Izu Peninsula, Middle Japan\*

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### 伊豆半島産海浜性等脚目甲殻類

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伊豆半島, 特に下田を中心とした南伊豆において等脚目甲殻類を調査した。調査は1998年の4月末の大潮時に行ったが, 他に筑波大学臨海研究センターの田中克彦 (現: 志津川自然センター), 青木優和両博士の採集品を合わせて調査することができた。後者には潮間帯の他に水深5m までのベントス調査の産物も含まれる。しかし, 寄生種ならびに間隙水種, 多くのウミミズムシ類については調査を行っていない。

以上の調査品の結果, 19科40種が確認され, うち3種は新種であることが判明し, それぞれ, *Amakusanthura aokii* (和名: アオキヒゲナガウミナナフシ), *Holotelson longicauda* (和名: オナガウミセミ), *Neastacilla tanakai* (和名: タオヤメヒメナナフシ) として記載した。

**Key words :** Isopoda, taxonomy, Izu, Shizuoka, *Amakusanthura*, *Holotelson*, *Neastacilla*  
**キーワード :** 等脚目, 伊豆半島, アオキヒゲナガウミナナフシ, オナガウミセミ, タオヤメヒメナナフシ, 新種



Fig.1 Map showing the sampling sites.

\*Contributions from the Toyama Science Museum No, 293.

As the results of the study on isopod crustaceans at the southern parts of Izu Peninsula, 40 species including 3 new to science will be reported.

**Order Isopoda**

**Suborder Asellota**

**Family Janiropsidae**

***Jaeropsis robata* Richradson, 1899**

*Material examined:* 1♂2♀, Taushi, June 19, 2000, coll. Katsuhiko Tanaka; 1♂3♀, Yumigahama, Minami-izu, June 4, 2001, coll. Katsuhiko Tanaka.

**Family Janiropsidae**

***Ianiropsis* sp.**

*Material examined:* 1♀, from a colony of calcareous algae, Nabeta, Oura, Shimoda-shi, May 9, 1993, coll. Makazu Aoki.

**Suborder Gnathiidea**

**Family Gnathiidae**

***Elaphognathia cornigera* (Nunomura, 1992)**

**(Japanese name: Shikatusno-uminanafushi)**

*Material examined:* 72♂♂ 15♀♀, 13youngs, Yumigahama, Minami-izu, June 4, 2001, coll. Katsuhiko Tanaka

**Suborder Anthuridea**

**Family Anthuridae**

***Amakusanthura aokii* sp.nov.**

**(Japanese name: Aoki-higenaga-uminanafushi)**

*Materials examined:* 2♂♂ (1♂holotype, 11.7mm in body length and 1♂ paratype, 6.9mm in body length), and 6♀♀ (1♀ allotype 10.5mm in body length and 5♀♀ paratypes, 7.4-10.0mm in body length), off Kisamsi, Shimoda-shi, 5 m in depth, Aug. 27, 1996. coll. Masakazu Aoki; 1♀ (paratype, 7.6mm in body length), off Kisami, Shimoda-shi, May 8, 1994, coll. Katsuhiko Tanaka; 1♂ (paratype, 7.1mm in body length), off Shimoda, May 7, 1997, coll. Katsuhiko Tanaka; Type series is deposited as follows: holotype (TOYA Cr-13018), allotype (TOYA Cr-13019) and 4 paratypes (TOYA Cr-13020~13023) at the Toyama Science Museum, 2 paratypes (OMNH Ar-6982~6983) at the Osaka Museum of Natural History, and 2 paratypes (NSMT Cr-15535) at the National Science Museum, Tokyo.

*Description of male:* Body 13.5 times as long as wide. Color white. Mutual length of cephalon, 7 pereonal somites and pleon is 2: 2: 2: 2: 3: 3: 3: 2: 3. Cephalon with rather strong concavity. Eyes rather big, but each ommatidium not discerned. Pleonites except 4-5, distinguished by suture lines. Pleotelson (Fig. 2S) lanceolate 2.5 times as long a wide and oblong, apical area rounded and with many setae on at tip and dorsal surface. A pair of statocysts big.

Antennule (Fig. 2D), reaching the anterior part of cephalon, with 8 segments. Antenna (Fig. 2F) long, reaching the middle part of pereonal somite 2, and stout. It composed of 3 peduncular and 20 flagellar segments.

Mandible (Fig. 2G) incisor 4-toothed. Palp 3-segmented, segment 2 with 2 relatively long setae; terminal segment shorter than the second, with 3 setae at the tip. Maxillula (Fig. 2H) with 8 teeth; outer 2 teeth somewhat longer than the inner six teeth. Maxilliped (Fig. 2I) with 4 segments; terminal segment with 7 setae on apical area, segment 3 with a longer seta on lateral margin.

Pereopod 1 (Fig. 2J) stout: basis 1.6 times as long as wide; ischium almost as long as basis, with a seta at inner distal angle; merus short, 1/2 as long as wide, with a seta at inner distal angle; carpus triangular, 1.5 times as long as wide, with 5-7 setae on inner distal area; propodus stout, 2.5 times as long as wide, with 8-9 setae on lateral

margin, 8-10 setae on inner margin and 8-10 setae on outer margin; dactylus relatively stout.

Pereopod 2 (Fig. 2K): basis rectangular, 3 times as long as wide; ischium, with 4 setae on inner margin and 2-3 setae on outer margin; merus with 6-7 setae on inner margin and 4-5 setae on outer distal area; carpus triangular, with 9-10 setae on outer margin; propodus with 4 setae on inner margin and 3-4 setae along inner margin.

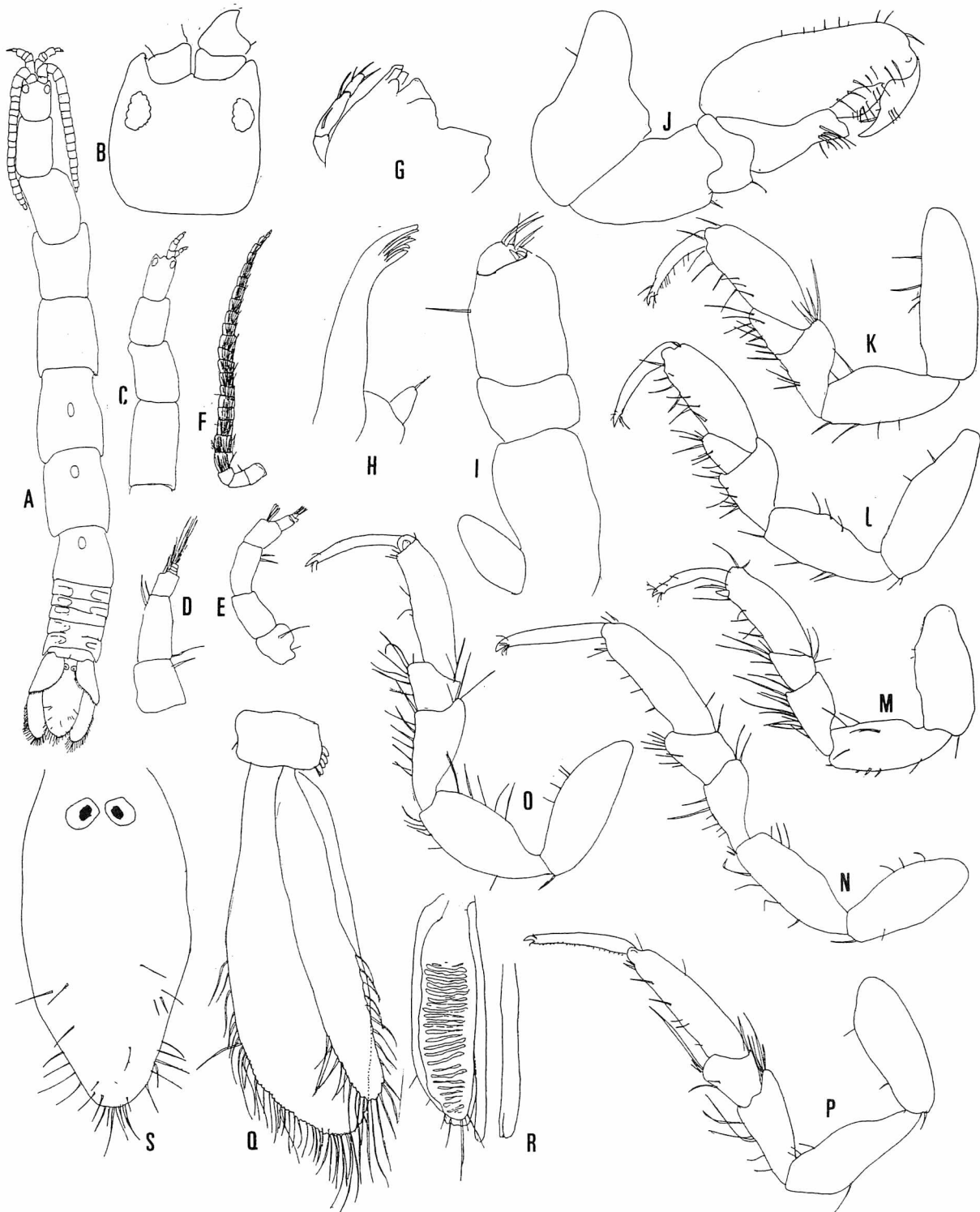


Fig.2 *Amakusanthura aokii* n. sp.

A:Dorsal view of male, B:Cephalon of the same, C:Dorsal view of anterior part of female, D:Antennule of female, E:Antenna of female, F:Antenna of male, G:Mandible; H:Maxillula, I:Maxilliped; J-P:Pereopods 1-7, Q: Pleopod 1, R:Pleopod 2, S:Pleotelson (A-B,F-Q:Male holotype, C-E:Female Allotype).

Pereopod 3 (Fig. 2L): basis oblong, 2.9 times as long as wide, with 2-3 setae at inner distal angle and 2-3 setae on outer margin; ischium  $\frac{3}{4}$  as long as basis, with 3-4 setae on both margins; merus triangular,  $\frac{1}{2}$  as long as ischium, with 7-9 setae on inner margin; carpus small and triangular, with 7-8 setae on inner margin; propodus slender and twice as long as carpus.

Pereopod 4 (Fig. 2M): basis 2.5 times as long as wide, with a seta at inner distal angle; ischium a little longer than basis, with 4-5 setae on inner margin and 4-5 setae on distal and outer sides; merus  $\frac{3}{5}$  as long as ischium, with more than a dozen long setae on inner margin; carpus trapezoid,  $\frac{1}{3}$  as long as ischium, with 6-8 long setae on inner margin and 4 long setae on outer margin; propodus twice as long as carpus.

Pereopod 5 (Fig. 2N): basis linear oblong, with 1-3 setae on outer margin and a seta at inner distal angle; ischium a little longer than basis; merus as long as basis, with 6 setae on inner margin; carpus half the length of merus, with several long setae on inner margin and outer distal angle, propodus slender, twice as long as carpus.

Pereopod 6 (Fig. 2O): basis 2.8 times as long as wide, with 1-4 setae on outer margin and a seta at inner distal angle; ischium as long as basis, with 4-6 setae on inner margin and 3-5 setae on outer margin; merus  $\frac{3}{4}$  as long as ischium, with 8 setae on inner margin and 1-3 setae on outer distal angle at outer distal angle; carpus 45% as long as merus, with 7-8 setae on inner margin and 1-2 setae at outer distal angle; propodus as long as basis, with 2 setae on inner margin and 3 short setae at inner distal angle and a short setae at outer distal angle; dactylus 80% as long as propodus; dactylus rather long.

Pereopod 7 (Fig. 2P): basis 2.6 times as long as wide, with 2 setae on outer margin and a seta at inner distal angle; ischium 1.1 times longer than basis, with a relatively long seta at middle part of inner margin and 3 setae on distal half of outer margin; merus 55% as long as ischium, with 5 long setae on inner margin and 4 long setae at outer distal area; carpus with 5-6 setae, one of them is very long and 1-2 setae at outer distal angle; propodus 6-7 setae on inner margin and 2-3 setae on outer margin; dactylus with many minute setae on inner margin.

Pleopod 1 (Fig. 2Q): basis rectangular, with 4-5 coupling hooks; endopod slender, with about 25 setae; exopod lanceolate, with 42-50 setae on the margin.

Pleopod 2 (Fig. 2R) of male: endopod lanceolate, with stylus extending a little beyond the both rami; exopod as long as endopod.

Uropod: endopod lanceolate; exopod ellipse.

*Female*: Almost same as male but differs in the following features: (1) shorter antennae, consisting only 4 flagellar segments and (2) lack of copulatory apparatus.

*Etymology*: The species name is dedicated to the collector, Dr. Masakazu Aoki of the Shimoda Marine Research Center, University of Tsukuba.

*Remarks*: The present new species is third one of the genus from Japan and differs from *Amakusanthura longiantennata* reported from Amakusa, western Kyushu, western Japan, in the following features: (1) presence of eyes (2) shorter and less numerous antennae, (3) rounded stylus of male second pleopod, (4) wider pleotelson, (5) stouter propodus of male first pleopod and (6) smaller statocysts on pleotelson.

The present species is also separated from *A. toyamaensis* from Toyama Prefecture, in the following features: (1) presence of eyes, (2) only weakly protruded pleotelson, (3) less numerous segments of antennula, (4) less numerous segments of antenna, (5) longer and rounded stylus of male second pleopod and (6) concaved anterior margin of cephalon.

#### Family Paranthuridae

##### *Paranthura japonica* Richardson, 1909

(Japanese name: Yamato-uminanafushi)

*Materials examined*: 1 ♀ (ovigerous with 10 eggs), off Kisami, Shimoda-shi, 5m in depth, Aug. 27, 1996. coll. Masakazu Aoki; 2 ♀♀ off Kisami, Aug. 8, 1999, col. Katsuhiko Tanaka.

*Paranthura* sp. (aff. *lineata* Nunomura, 1997)

(Fig. 3)

*Materials examined:* 1 ♀ (8.5mm in body length), off, Nabeta, Shimoda-shi, Apr. 29, 1998. coll. Noboru Nunomura.

*Description:* Body 11 times as long as wide. Color dull yellow with irregular darker patterns on dorsal surface. Cephalon (Fig. 3B); antero-lateral angle protruded and the medial process low and short. Demarcation of pleonal somites (Fig. 3C) visible only lateral margin; the last segment with pronounced posterior medial cleft.

Eyes rather big, each eye with 16 ommatidia. Antennula (Fig. 3D) with 5 segments. Antenna (Fig. 3E) a little longer than antennule, with 6 segments, terminal segment with a tuft of setae at the tip. Mandible (Fig. 4F): palp 3segmented, segment 2 with a long seta, terminal segment with 9 setae on distal area. Maxillula (Fig3G) long, with 11 saw-like teeth. Maxilliped (fig. 3H) with 2 free segments.

Pereopods 1-3 subchelate. Pereopods 4-7 for walking legs. Pereopod 1 (Fig. 3I): basis rectangular 2.5 times as long as wide; ischium as long as basis; merus short; carpus triangular, with 5 relatively long setae on inner margin; propodus stout, with many setae on inner margin; dactylus long, as long as inner margin of propodus.

Pereopod 2 (Fig. 3J) a little narrower than the pereopod 1: basis and ischium rectangular; merus triangular; carpus triangular; propodus stout, with 6 setae on inner side; dactylus long, as long as inner margin of propodus.

Pereopod 3 (Fig. 3K) a little longer than the pereopod 2: basis and ischium rectangular; merus and carpus triangular; propodus narrower than that of pereopod 2, with 7 stout setae on inner margin; dactylus long, but a little shorter

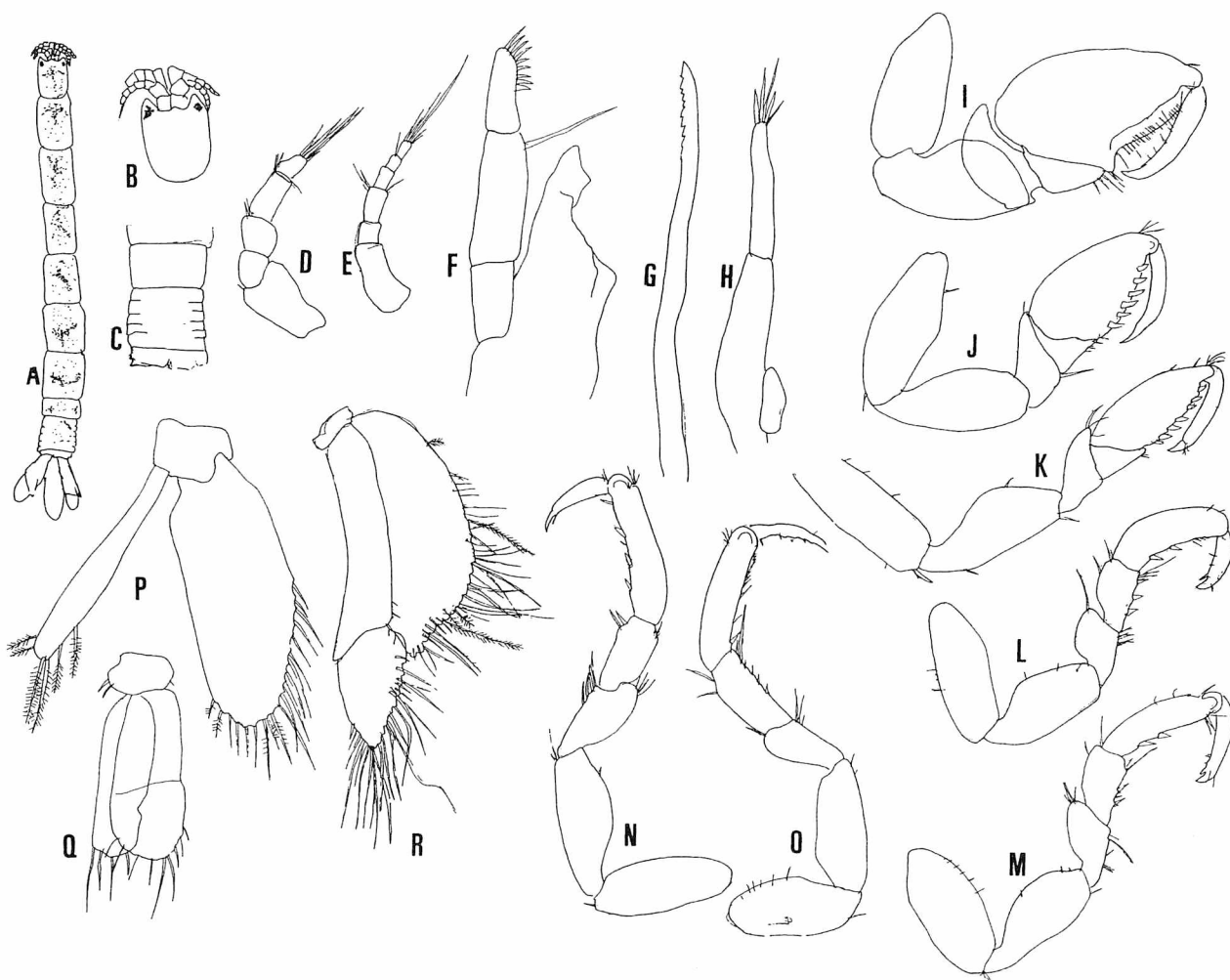


Fig.3 *Paranthura* sp. (aff. *lineata* Nunomura, 1997)

A: Dorsal view, B: Cephalon, C: Last pereonal segment and pleonal segments, D: Antennule; E: Antenna, F: Mandible, G: Maxillula. H: Maxilliped, I-O: Pereopods 1-7, P-Q: Pleopods 1-2, R: Uropod (All: Female).

than the inner margin of propodus.

Pereopod 4 (Fig. 3L): basis and ischium rectangular; merus 2/5 as long as ischium; carpus little longer than merus, with 3 stouter and 3 longer setae on inner margin; propodus 3 times as long as wide, with 2 stout setae on the basal half of inner margin; dactylus half the length of propodus.

Pereopod 5 (Fig. 3M): basis and ischium rectangular; merus 2/5 as long as ischium; carpus a little longer 2.6 times as long as wide, with 2 stout setae on the basal half of inner margin; propodus 2.8 times as long as carpus, with 2 stout setae on inner margin; dactylus 3/5 as long as propodus.

Pereopod 6 (Fig. 3N): basis and ischium rectangular, ischium a little longer than basis; merus 2/5 as long as ischium; with 4-5 setae on the distal half of inner area of inner margin and outer distal angle; carpus a little shorter than merus, with 2-3 setae on distal half of both margins; propodus 3.7 times as long as wide, with 3-4 stout setae on inner margin; dactylus half the length of propodus.

Pereopod 7 (Fig. 3O): basis rectangular; ischium a little longer than merus; merus 2/5 as long as ischium; carpus a little shorter than merus, with 2 setae on distal half of both margins; propodus; 4.2 times as long as wide, with 2 stout setae on the basal half of inner margin; dactylus half the length of propodus.

Pleopod 1 (Fig. 3P): with endopod narrow and exopod wide.

Pleopod 2 (Fig. 3Q): both rami rectangular, with 4-9 setae on distal margin.

Uropod (Fig. 3R): exopod oval, with about 45 setae including feather-like ones around the margin.

*Remarks:* This female specimen is most closely allied to *Paranthura lineata* Nunomura, 1997 but differs from *lineata* in the following features: (1) lack of transverse color patterns on dorsal surface of pereonal somite, (2) shallower cleft on the posterior border of last pleonal somite, (3) shorter body and (4) longer dactylus on pereopods 1 and 2.

This female specimen is also allied to *Paranthura kagawaensis* Nunomura from Seto Inland Sea, but the former is separated from the latter in the following features; (1) less numerous setae of both antennae, (2) less numerous saw-like setae of maxilliped and (3) more strongly serrated margin of uropod.

This female specimen differs from *Paranthura japonica* Richardson, common species of Japan and its neighboring waters, in the following features: (1) separated ommatidia of eye, (2) less numerous saw-like teeth of maxillula, (3) more strongly serrated margin of uropod, (4) less numerous spines on inner side of propodus of pereopods 2-3, (5) shorter but less numerous seta on mandibular palp and (6) less numerous segmentation of both antennae. But I refrained to establish to new species, because only one female specimen has been found.

### Flabellifera

#### Family Cirolanidae

##### *Eurydice longiantennata* Nunomura & Ikehara, 1985

(Japanese name: Higenaga-sunahorishi)

*Material examined:* 2♀♀, off Kisami, Shimoda-shi, May 8, 1994, coll. Katsuhiko Tanaka.

##### *Excirrolana chiltoni* Richardson, 1902

(Japanese name: Hime-sunahorishi)

*Material examined:* 2♂♂11♀♀, on the dead fish, *Plotosus lineatus* (Thunberg), Nabeta, Shimoda-shi, June, 7, 1994, coll. Katsuhiko Tanaka.

##### *Cirolana harfordi japonica* Thielmann, 1910

(Japanese name: Nise-sunahorimushi)

*Material examined:* 1♂1♀, intertidal zone of Taushi, Shimoda-shi, June 19, 2000, coll. Katsuhiko Tanaka.

#### Family Sphaeromatidae

***Gnorimosphaeroma rayi* Hoestlandt, 1969**

**(Japanese name: Iso-kotsubumushi)**

*Materials examined:* 1♂ Shimoda Port, date and collector unknown; 6 youngs, Taushi, Shimoda-shi, June 19, 2000, coll. Katsuhiko Tanaka.

***Dynoides dentisinus* Shen, 1929**

**(Japanese name: Shiriken-umisemi)**

*Material examined:* 1♂1♀, Nabeta, Shimoda-shi, Apr. 29, 1998, coll. Noboru Nunomura.

***Chitonosphaera lata* (Nishimura, 1968)**

**(Japanese name: Habahiro-kotsubumushi)**

*Material examined:* 1♀, Taushi, Shimoda-shi, June 19, 2000, coll. Katsuhiko Tanaka.

***Cymodoce japonica* Richardson, 1907**

**(Japanese name: Nihon-kotsubumushi)**

*Material examined:* 1♀, intertidal Taushi, Shimoda-shi, June 19, 2000, coll. Katsuhiko Tanaka.

***Holotelson tuberculatus* Richardson, 1909**

**(Japanese name: Chibi-umisemi)**

*Material examined:* 1♂, Nabeta Bay, June 4, 1996, coll. Katsuhiko Tanaka.

***Holotelson longicauda* sp. nov.**

**(Japanese name: Onaga-umisemi, new)**

**(Fig. 4)**

*Material examined:* 1♂ (holotype, 10.6 mm in body length) Shimoda, Apr. 4, 1996, coll. Katsuhiko Tanaka and 1♀ (allotype, 6.3 mm in body length), Nabeta Bay, Apr. 4, 1996. Type series is deposited as follows: holotype (TOYA Cr-13024) and allotype (TOYA Cr-13025) at the Toyama Science Museum.

*Description of male:* Body elliptical, 2.2 times as long as wide. Color dull yellow. Tip of pleotelson with a remarkable medial process toward backwards, its tip with a shallow concavity at the tip. This projection with a pair of small protuberance at the inner basal area. Dorsal surface of pleonal somite with 6 protuberances. The posterior end of seventh pereoneal somite with a pair of projections protruded backwards.

Antennule (Fig. 4B): basal segment big and 8-9 flagellar segments almost square. Antenna (Fig. 4D) with 5 peduncular segments and 11-12 flagellar segments. Mandible (Fig. 4E): pars incisiva 3-toothed; lacinia mobilis 3-toothed; palp 3-segmented, second segment with 6-7 setae on the distal half; terminal segment with 14-15 setae. Maxillula (Fig. 4F): inner lobe with 4 hairy bristles at the tip; outer lobe with 10 teeth on the border, 2 inner ones serrated. Maxillula (Fig. 4G): inner lobe with 10 hairy setae. Each branch of outer lobe with 8 teeth at the tip. Maxilliped (Fig. 4H): endite with 8 plumose setae on terminal area and a hook on lateral border; palpal segment 1 small; segment 2 long, with segment 3 wide but short; segment 4 slender: terminal segment slender.

Pereopod 1 (Fig. 4I) shorter than the other legs; basis 1.8 times as long as wide; ischium almost as long as wide; merus short, 1/4 as long as basis; carpus short and triangular, as long as merus; propodus 3/5 as long as basis.

Pereopod 2 (Fig. 4J): basis 4.5 times as long as wide; ischium 3/4 as long as basis; merus 4/5 as long as ischium, with many seta on inner margin; carpus a little shorter than merus, with many setae on inner margin; propodus 2/3 as long as basis, with many setae on inner margin.

Pereopod 3 (Fig. 4K): basis 1.9 times as long as wide; ischium almost as long as basis; merus almost half the length of ischium, with many setae on inner margin; carpus a little shorter and slenderer than merus, with many setae on inner margin; propodus twice longer than carpus, with many setae on inner margin.



Pereopod 4 (Fig. 4L): basis 1.9 times as long as wide; ischium  $\frac{4}{5}$  as long as basis; merus 2.8 times longer than ischium, with many setae on inner margin; carpus as long as merus; propodus twice longer than merus, with many setae on inner margin; dactylus rather long.

Pereopod 5 (Fig. 4M): basis robust, 2.1 times as long as wide; ischium narrower than basis,  $\frac{3}{5}$  as long as wide; merus less than half the length of ischium; carpus as long as merus, with many setae on inner margin; propodus twice longer than carpus, with many setae on inner margin; dactylus rather long.

Pereopod 6 (Fig. 4N) a little longer than pereopod 5: basis 2.5 times as long as wide; ischium narrower than basis, and  $\frac{3}{4}$  as long as basis; merus  $\frac{1}{4}$  as long as ischium, with many setae on inner margin; carpus 1.3 times as long as merus, with many setae on inner margin; propodus 1.6 times as long as carpus with many setae on inner margin; dactylus rather long.

Pereopod 7 (Fig. 4O): basis 2.5 times as long as wide; ischium 0.7 times as long as basis; merus  $\frac{1}{3}$  as long as ischium, with many setae on inner margin; carpus as long as merus, with many setae on inner margin; propodus 1.6 times as long as carpus, with 4 teeth and many setae on inner margin; dactylus rather long.

Penes (Fig. 4P) rather short, each penis 2.0 times longer than wide.

Pleopod 1 (Fig. 4Q); basis rectangular,  $\frac{1}{3}$  as long as wide; both rami rectangular, with many setae; endopod

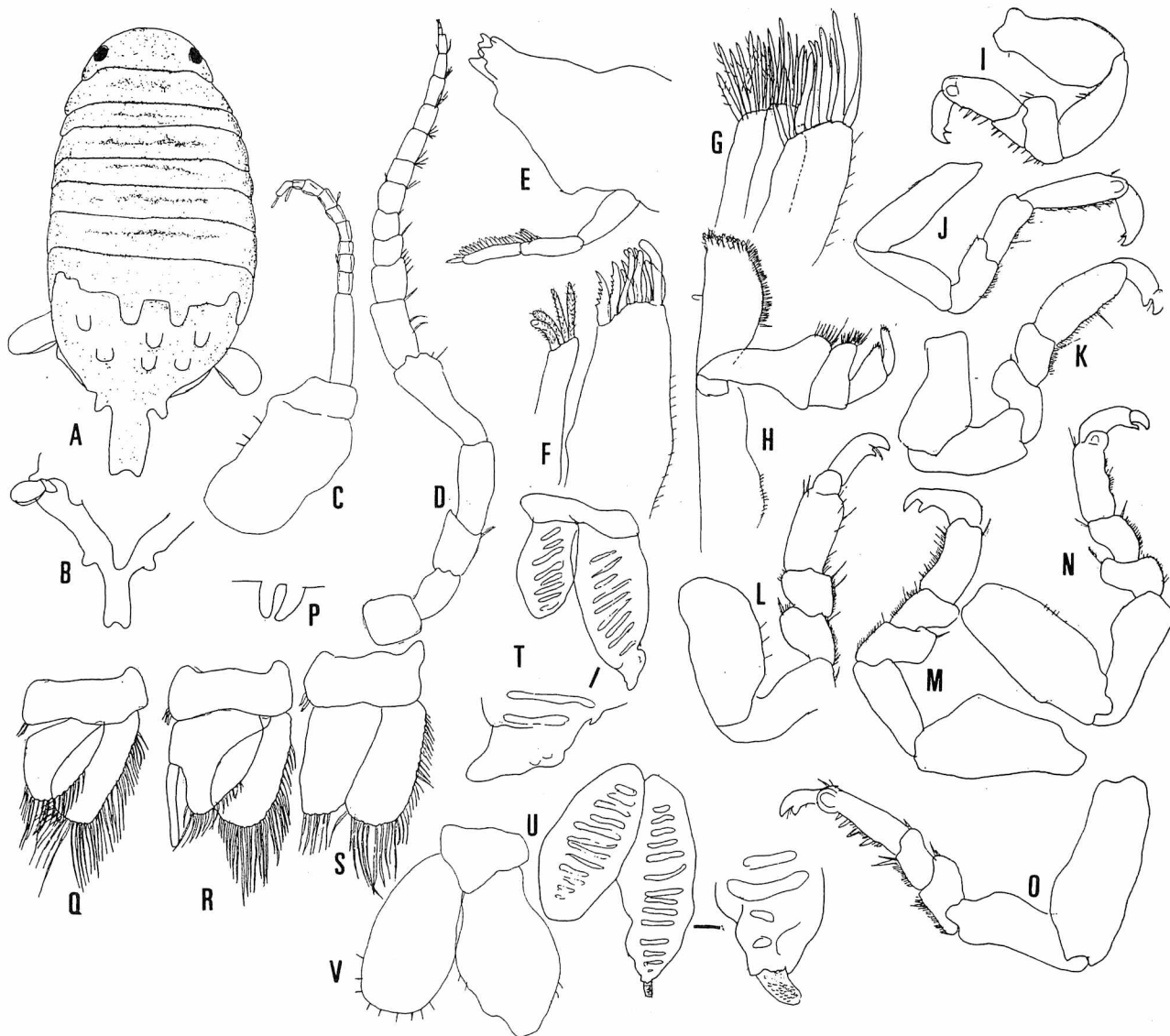


Fig.4 *Holotelson longicauda*. n. sp.

A: Dorsal view; B: ventral view of posterior part showing a uropod; C: Antennule, D: Antenna, E: Mandible; F: Maxillula; G: Maxilla; H: Maxilliped; I-O: Pereopods 1-7, P: Penes, Q-U: Pleopods 1-5, V: Uropod (All: Male Holotype).

lanceolate; exopod lanceolate.

Pleopod 2 (Fig. 4R); basis rectangular, 1/3 as long as wide; stylus 4/5 as long as endopod, endopod with 12-14 setae around the margin; exopod with 35 setae around the margin.

Pleopod 3 (Fig. 4S); both rami lanceolate, with many setae.

Pleopod 4 (Fig. 4T); both rami lanceolate, with thickening.

Pleopod 5 (Fig. 4U); endopod lanceolate, with thickening; exopod with a scale lobe at the tip.

Uropod (Fig. 4V) basis rectangular; endopod with 8-9 relatively short setae around the margin; exopod rectangular with slightly sinuate margin and 3-4 setae.

*Female*: Almost the same as male except copulatory apparatus.

*Etymology*: longus= long in Latin, caudus= tail of animals in Latin.

*Remarks*: This species is separated from *Holotelson tuberculatus* Richardson 1909 in the following features: (1) strongly protruded projection of posterior end, (2) presence of on pleotelson, (3) absence of suture lines, (4) presence of a pair of projections on 7th pereonal somite and (5) reduction of uropodal exopod.

This species is separated from another Japanese species, *Holotelson decoratus* Nunomura in the following features: (1) strongly protruded projection of posterior end, (2) less numerous protuberances of pleonal somite, (3) presence of stout setae on carpus of pereopod VII, (4) shorter setae of mandibular palp and (5) shorter setae on maxillipedal palp and (6) rounded uropod.

***Cymnodecella nipponica*, (Nishimura, 1969)**

**(Japanese name: Tsutsoo-umisemi)**

*Material examined*: 1 ♀, from calcareous algae, Nabeta Shimoda-shi, May 9, 1993, coll. Makazu Aoki; 4 ♂♂ 1 ♀, near light house, Shimoda-shi, May 20, 1996 coll. Katsuhiko Tanaka.

***Leptosphaeroma gottschei* Hilgendorf, 1885**

**(Japanese name: Hirata-umisemi)**

*Material examined*: Oura, Apr. 28, 1998, coll. Noboru Nunomura; 5 ♀♀, intertidal zone of Yumigahama, Minami-izu, June 4, 2001, coll. Katsuhiko Tanaka; 2 ♂♂ 14 ♀♀, June 19, 2000, Taushi, Shimoda, coll. Katsuhiko Tanaka; 1 ♂ 2 ♀♀, Nabeta Apr. 28, 1998, coll. Noboru Nunomura; 22 exs. Yumigahama, Minami-izu-machi, Apr. 29, 1998 coll. Noboru Nunomura.

**Suborder Valvifera**

**Family Arcturidae**

***Neastacilla tanakai* n. sp.**

**(Japanese name: Taoyame-himenanafushi, new)**

**(Fig. 5)**

*Materials examined*: 10 ♂♂ (1 ♂ holotype, 12.0mm in body length and 9 ♂♂, 5.8-12.6 mm in body length) and 5 ♀♀ (1 ♀ allotype, 11.5mm in body length and 4 ♀♀, 8.2~10.5 mm in body length), off, Shimoda-shi, xm in depth, coll. Masakazu Aoki and Katsuhiko Tanaka. May 7, 1997; 1 ♂, paratype, off Kisami, Shimoda-shi, 45m in depth Aug. 18, 1999. coll. Katsuhiko Tanaka; 11 ♂♂ (paratypes, 6.5~9.1mm in body length) and 2 ♀♀ (paratypes, 5.5~8.2mm in body length), off Kisami, Shimoda-shi, Nov. 24. coll. Katsuhiko Tanaka. Type series is deposited as follows: holotype (TOYA Cr 13026), allotype (TOYA Cr-13027) and 18 paratypes (TOYA Cr-13028~13036) at the Toyama Science Museum, 4 paratypes (NSMT Cr-15536) at the National Science Museum, Tokyo, and 4 paratypes (OMNH Ar-6984~69837) at the Osaka Museum of Natural History.

*Description of male*. Body (Fig. 5A) elongated, 17.5 times as long as wide, mutual length of 7 pereonal somites is: 1: 1: 1: 12: 1.5: 1.5: 1.5. Cephalon with slightly protruded antero-lateral angles and a low medial process. Eyes mediocre in size; each eye with about 200 ommatidia Posterior end of pleotelson triangular and rather acute.

Antennula (Fig. 5D): segment 1 stout and round; segments 2 and 3 rectangular; segment 4 long, with 4 aesthetascs at the tip. Antenna (Fig. 5E) reaches the posterior margin of pereonal somite 4 and composed of 2 peduncular segments and 2 flagellar segments. Mutual length of 5 peduncular segments is 2: 2: 7: 13: 12. Flagellum approximately  $2/7$  as long as the fifth peduncular segment and mutual length of 2 flagellar segments is 4: 7. Mandible (Fig. 5F); pars incisiva 3-toothed; lacinia mobilis 3-toothed; processus molaris wide. Maxillula (Fig. 5G): inner lobe with 3 hairy bristles at the tip; outer lobe with 8 teeth at the tip. Maxilla (Fig. 5H): inner lobe with 13-14 setae; each ramus of outer lobe with 3 setae. Maxilliped (Fig. 5I): endite wide, with 3 long and stout setae on lateral margin. Palp slender, segment 3 elongated.

Pereopods 1-4 increasing posteriorly. Pereopod 1 (Fig. 5J): basis rectangular, 5 times as long as wide; ischium relatively short,  $1/3$  as long as basis; merus a little longer than ischium, with 8-9 long setae on inner margin; carpus 1.6 times as long as merus, with many long setae on inner margin; propodus a little shorter than carpus, with many long setae on inner and distal margins; dactylus small.

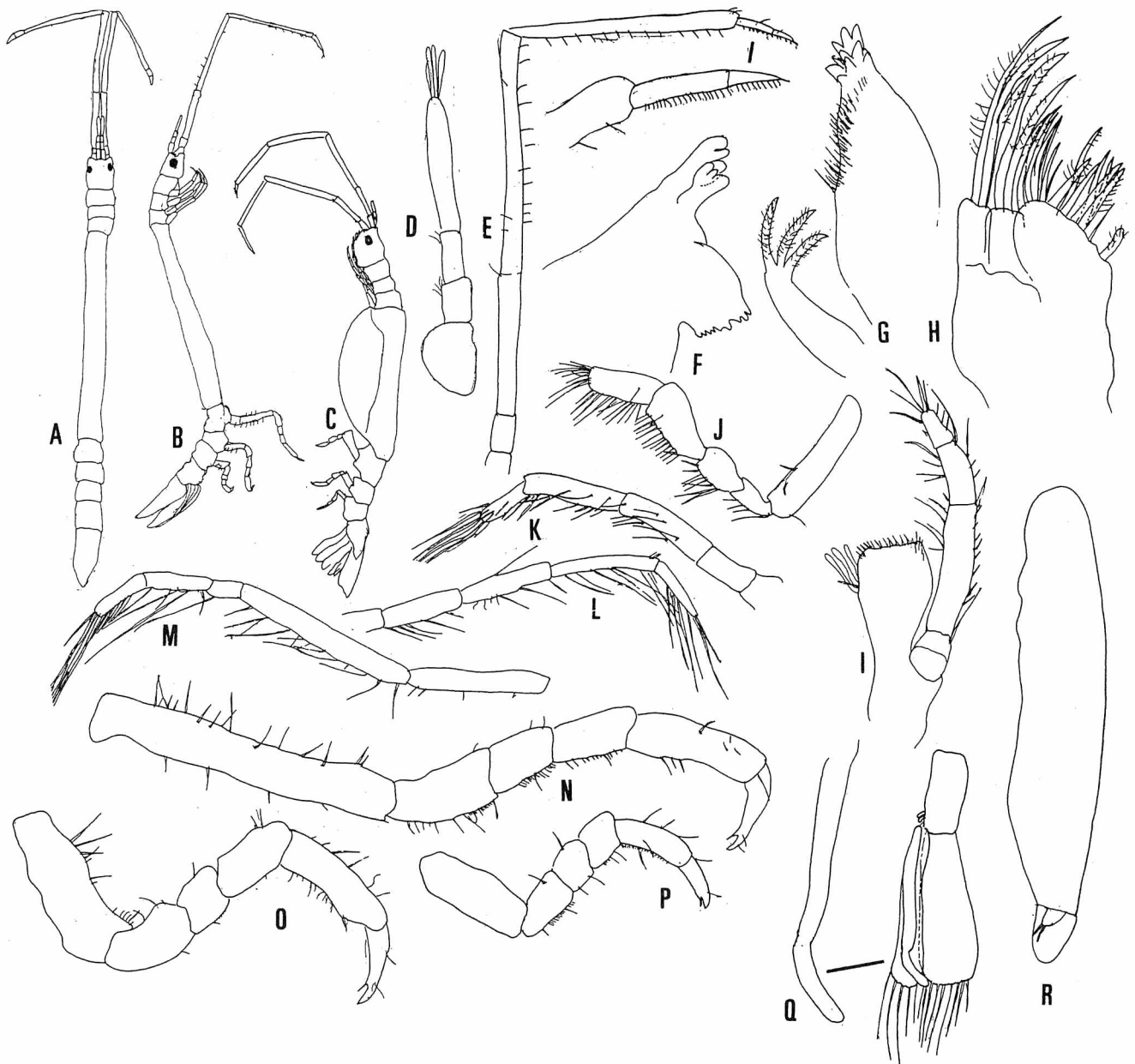


Fig. 5 *Neastacilla tanakai* n. sp.

A: Dorsal view of Male; bilateral view of the same, C: lateral view of female. D: Antennule, E: Antenna, F: Mandible, G: Maxillula, H: Maxilla, I: Maxilliped, J-P: Pereopods 1-7, Q: Male second pleopod, R: Uropod. (A-B, D-R: Holotype male, C: Allotype female)

Pereopods 2-4 (Fig. 5K) similar in shape. Pereopod 2 (Fig. 5K): basis short; ischium relatively short, 2.3 times as long as wide; merus twice longer than ischium, with 7-8 longer setae; carpus as long as merus, with 12 setae; propodus 1/2 as long as carpus, with 12-15 setae on inner and distal margins.

Pereopod 3 (Fig. 5L): basis short; ischium relatively 4.3 times as long as wide, with 5 setae on inner margin; merus 1.2 times longer than ischium, with 4 shorter setae on basal half of inner margin, 3 longer setae on distal half of 1 inner margin and a long seta on distal margin; carpus a little longer than propodus, with 8-10 setae on inner margin; propodus 4/5 as long as carpus, with 8-10 setae on inner and distal margins.

Pereopod 4 (Fig. 5M) longer than the preceding pereopods; basis rectangular, 6.5 times as long as wide; ischium 1.4 times as long as basis, with about 12 long setae on inner margin; merus short, 1/6 as long as ischium, with a long seta on inner margin; carpus 1/3 as long as ischium, with 5-6 long setae on inner margin; propodus as long as carpus, with 14-15 setae on inner and distal margins.

Pereopods 5-7 robust. Pereopod 5 (Fig. 5N): basis long, with 4 setae on inner margin and more than 15 setae on outer margin; ischium with 10 setae on inner margin; merus 2/3 as long as ischium, with many setae on inner margin; carpus a little longer than merus, with 15 short setae on inner margin; propodus with 3 setae on basal half on inner margin.

Pereopod 6 (Fig. 5O) shorter than the fifth: basis with 3-5 longer and 8-10 shorter setae on outer margin; ischium with 2-3 setae on outer margin; merus almost square, with some setae on outer margin; carpus longer than merus, with 3-4 setae on outer margin; propodus longer than carpus, with 7-10 setae on inner margin and 6-7 setae on outer margin.

Pereopod 7 (Fig. 5P): basis a little shorter than pereopod 6; ischium almost half the length of basis, with many setae on the margin; merus square in shape with several setae on inner margin; carpus almost as long as merus; propodus 1.4 times longer than carpus, on inner margin and 3 setae on outer margin, and with 2 longer setae on inner margin.

Pleopod 2 (Fig. 5Q): basis 2.7 times as long as wide with 2 hooks on inner lateral margin; endopod with 5 setae on distal margin stylus exceeds a little longer than endopod; exopod a little wider than endopod and, with 7-8 setae. Uropod. (Fig. 5R) long, 5.5 times as long as wide.

Female. Female is obviously shorter than male. 12 times as long as wide. Mutual length of pereonal somites area 1: 1: 1: 9: 2: 1.5: 1.5: 1.5. Eyes lacking.

*Etymology*: The species name is dedicated to Dr. Katsuhiko Tanaka of the Sizugawa Nature Center and researcher on isopod crustaceans, and the collector the many interesting materials.

*Remarks*: The present species is most closely allied to *Neastacilla kanowana* King, 2003 reported from Australia, but differs from the latter in the following features: (1) longer body, (2) shape of stylus on male second pleopod, (3) shape of Pleotelson, especially of absence on lateral margin, (4) less numerous (only 2) segmented flagellum of antenna, (5) shape of maxilliped and numerous coupling hooks on lateral margin of endite, (6) numerous but shorter setae on pleopods, (7) absence of plumose setae on pereopods, (8) shorter setae on pleopods, less numerous setae on inner lobe of maxilla and (9) shorter setae on pereopods.

#### Family Chaetillidae

##### *Symmius caudata* Richardson, 1904

(Japanese name: Yaribo-heramushi)

*Material examined*: 2♂♂14 ♀♀, by dredge off Kisami, Shimoda-shi, May 18, 1994; 1♂4 ♀♀, 45m in depth, Aug. 18, 1999, coll. Katsuhiko Tanaka; 5♀♀, off Shimoda-shi, Aug. 12, 1994. Coll Katsuhiko Tanaka.

#### Family Idoteidae

##### *Idotea metallica* Bosc, 1802

(Japanese name: Nagaremo-heramushi)

*Material examined:* 5 ♀♀, from drift weed, off Shimoda-shi, Aug. 12, 1994, coll. Katsuhiko Tanaka.

***Idotea ochotensis* Brandt. 1851**

**(Japanese name: Ohotsku -heramushi)**

*Material examined:* 1♂, from drift sea weeds, off Shimoda-shi, July 7, 1993, coll. Masakazu Aoki.

***Cleantiella isopus* Grube, 1883**

**(Japanese name: Iso-heramushi)**

*Material examined:* 1♀, from colonies of calcareous algae, Nabeta Ooura, Shimoda-shi, May 9, 1993, coll. Masakazu Aoki; 1♂1♀, Nabeta, Shimoda-shi, Aprt. 28, 1998, coll. Noboru Nunomura; 1♀, Nabeta, Shimoda-shi, Aprt. 29, 1998, coll. Noboru Nunomura.

***Cleantiella strasseni* (Thielemann, 1910)**

**(Japanese name: Ohiraki-heramushi)**

*Material examined:* 1♀, Intertidal, Suzaki, Apr. 3, 1996; 1♀, off Shimoda-shi, May 18, 1994; 1♂, off Kisami, Shimoda-shi, 50m coll. Katsuhiko Tanaka.

***Cleantoides planicauda* Benedict, 1899**

**(Japanese name: Hoso-heramushi)**

*Material examined:* 2♀♀, on the sea weed, *Zostera marina* Nabeta, Shimoda-shi, July 17, 1993. coll. Aoki; 2♀♀1y, by trawl off Nabeta, June 14, 1994; off Kisami, Shimoda-shi, Apr. 27, 1996; 3♀♀ Nabeta, June 6, 1994.

***Synisoma pacificum* Nunomura, 1974**

**(Japanese name: Kuroshio-naga-heramushi)**

*Material examined:* 1♂3♀♀, May 25, 1993 on *Sargassum* bed, Nabeta Bay, Shimoda-shi, coll. Masakazu Aoki, 2♀♀, May 17, 1994; 3♀♀ Nabeta Bay, 1994. Coll. Katsuhiko Tanaka.

***Synidotea hikigawaensis*, Nunomura, 1974**

**(Japanese name: Herikire-waraji-heramushi)**

*Material examined:* 1♀, off. Shimoda, May 7, 1997, coll. Katsuhiko Tanaka; 1♂3♀♀, off Kisami, Nov. 24, 1999 coll. Katsuhiko Tanaka.; 1♀, off Kisami, Shimoda-shi, Aug. 27, 1997, coll. Masakazu Aoki.

***Synidotea laevidorsalis* (Miers, 1881)**

**(Japanese name: Waraji-heramushi)**

*Material examined:* 2♀♀, off Kisami, Shimoda-shi, Aug. 27, 1997, coll. Masakazu Aoki.

***Paridotea munda* Nunomura, 1988**

**(Japanese name: Kindachi-heramushi)**

*Material examined:* 1♂, Nabeta, Shimoda-shi, May 11, 1994, coll. Katsuhiko Tanaka.

***Pentias* sp.**

*Material examined:* 3♀♀ Drifting weed. off Shimoda-shi, 1♀, Nabeta, Apr. 29, 1988, coll. Katsuhiko Tanaka; 1♂, 6♀♀, Ooura, Apr. 28, 1988. coll. Katsuhiko Tanaka.

**Suborder Oniscidea**

**Family Ligiidae**

***Ligia exotica* Roux, 1928**

**(Japanese name: Funamushi)**

*Material examined*: 1♂, Taushi, Apr. 29, 1998, coll. Noboru Nunomura, 2♂♂, Irita Harbor, Shimoda-shi, Apr. 29, 1998, coll. Noboru Nunomura, 2♂♂, 3♀♀, Nabeta, Shimoda-shi, Apr. 29, 1998 coll. Noboru Nunomura; 1♀, Yumigahama, Minami-izu-machi, Apr. 29, 1998, coll. Noboru Nunomura.

**Family Scyphacidae**

***Armadilloniscus japonicus* Nunomura, 1984**

**(Japanese name: Hama-warajimushi)**

*Material examined*: 1♀, Futou, Nishi-izu, Apr. 30, 1998, coll. Noboru Nunomura, 4♀♀, Nabeta, Shimoda-shi, Apr. 28, 1998, coll. Noboru Nunomura; 1♂1♀, Nabeta, Shimoda-shi, Apr. 28, 1998, coll. Noboru Nunomura.

***Koshiniscus notoensis* Nunomura, 1990**

**(Japanese name: Notochouchin-warajimushi)**

*Material examined*: 1♀, Nabeta, Shimoda, Apr. 28, 1998, coll. Noboru Nunomura; 1♀, Nabeta, Shimoda-shi, Apr. 29, 1998, coll. Noboru Nunomura.

**Family Alloniscidae**

***Alloniscus balssi* (Verhoeff, 1928)**

**(Japanese name: Nihon-tama-warajimushi)**

*Material examined*: 2♂♂7♀♀, Shimoda, Apr. 29, 1998, coll. Noboru Nunomura; 1♀, Shimoda-shi, Apr. 29, 1998, coll. Noboru Nunomura; 1♀, Futou, Nishi-izu-machi, Apr. 30, 1998, coll. Noboru Nunomura; 2♂♂2♀♀, Yumigahama, Minami-izu-machi, Apr. 29, coll. Noboru Nunomura; 2♂♂7♀♀, Nabeta, Apr. 28, 1998, coll. Noboru Nunomura.

**Family Philosciidae**

***Littorophiloscia nipponensis* Nunomura, 1984**

**(Japanese name: Nippon-hi-ro-warajimushi)**

*Material examined*: 12♀♀, Iritahama, Shimoda, Apr. 29, 1998, coll. Noboru Nunomura; 4♀♀, Nabeta, Shimoda-shi, Apr. 29, 1998, coll. Noboru Nunomura; 18♀♀, Apr. 28, 1998, coll. Noboru Nunomura.

**Family Trachelipidae**

***Lucaisoides nishimurai* (Nunomura, 1987)**

**(Japanese name: Satoyama-warajimushi)**

*Material examined*: 1♂ 3♀♀, Nabeta, Shimoda-shi, Apr. 28, 1998, coll. Noboru Nunomura.

**Family Porcellionidae**

***Porcellio scaber* Latreille, 1904**

**(Japanese name: Warajimushi)**

*Material examined*: 2♀♀ (1♀, ovigerous), Nabeta, Shimoda-shi, Apr. 28, 1998, coll. Noboru Nunomura.

***Porcellionides pruinosus* (Brandt, 1833)**

**(Japanese name: Hoso-warajimushi)**

*Material examined*: 1♂1♀, Nabeta, Shimoda-shi, Apr. 29, 1998, coll. Noboru Nunomura.

**Family Armadillidae**

***Spherillo obscurus* (Budde-Lund, 1855)**

**(Japanese name: Tokyo koshibiro-dango-mushi)**

*Material examined:* 3 ♀ ♀, Shimoda-shi, Apr. 29, 1998, coll. Noboru Nunomura.

**Family Armadillidiidae**

***Armadillidium vulgare* (Latreille, 1804)**

**(Japanese name: Oka-dango-mushi)**

*Material examined:* 7 ♂ ♂ 6 ♀ ♀, Nabeta, Shimoda-shi, Apr. 28, 1998, coll. Noboru Nunomura; 1 ♀, Nabeta, Shimoda-shi, Apr. 29, 1998, coll. Noboru Nunomura.

**Suborder Tyloidea**

**Family Tyllidae**

***Tylos granuliferus* Budde-Lund, 1855**

**(Japanese name: Hama-dango-mushi)**

*Material examined:* 1 ♀, Nabeta, Shimoda-shi, Apr. 29, 1998, coll. Noboru Nunomura.

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